

Mental Health Literacy Among Urban and Rural Residents of Guangdong Province, China

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Purpose: The study aims to understanding the mental health literacy level of urban and rural residents in Guangdong Province, the first major province in China, and its influencing factors is crucial.

Methods: A multi-stage stratified equal-volume random sampling method was adopted in October-December 2022 to select permanent residents aged 18 years and above in Guangdong Province for the questionnaire survey, which consisted of a general demographic information questionnaire and a national mental health literacy questionnaire. Rao-Scott χ^2 -test with correction based on sampling design, independent samples *t*-test and binary multivariate logistic regression analysis were performed.

Results: A total of 51744 individuals completed the questionnaire, including 31822 urban residents and 19200 rural residents. The rate of achievement of mental health literacy was 13.6% among urban residents, which was significantly higher compared to the rate of 8.6% among rural residents. Logistic regression analysis showed that female, higher education, being mental worker, being a retiree, having a higher monthly household income, maintaining a regular diet, and using electronic products for 2–6 hours per day were protective factors for mental health literacy attainment in urban residents, while having chronic diseases, being a smoker and having a history of drinking were identified as risk factors in urban residents. Among in rural residents, married, younger, higher education, being mental worker and using electronic products for 2–6 hours per day, maintaining a regular diet, and engaging in regular exercise were protective factors for achieving mental health literacy, while previous smoking was a risk factor.

Conclusion: The study revealed a low level of mental health literacy among urban and rural residents of Guangdong Province, with a significant disparity between the two areas. These findings highlight the need for continuing efforts to increase the dissemination of mental health knowledge in rural communities and improve levels of mental health literacy.

Keywords: mental health literacy, urban and rural residents, cross-sectional studies

Introduction

Mental health literacy, which refers to the understanding and awareness that enable individuals to recognize, handle, or prevent mental illnesses, encompasses the integration of knowledge, skills, and attitudes for the promotion and maintenance of mental well-being.¹

Individuals with a high level of psychological literacy are better equipped to identify psychological disorders accurately, actively seek mental health knowledge, and willingly seek help from mental health professionals.^{2–4} Furthermore, they adopt a scientific approach to maintaining and promoting mental health, ultimately benefiting not only themselves but also those around them.⁵ Mental health literacy is recognized as a crucial component of overall health literacy, directly impacting an individual's mental well-being.^{6,7} Consequently, numerous studies have been conducted to assess mental health literacy levels, with findings consistently revealing higher levels in developed countries.^{8–10} Furthermore, interventions aimed at improving mental health literacy have been successful in these countries.^{11–13} In developing countries, research on mental health literacy

is in its infancy and mental health literacy levels are low, for example, the adequate mental health attainment rate among youth in Malaysia is 9.1%.^{14,15}

China, as a developing country, is undergoing a rapid economic and social transition, presenting new challenges for mental health maintenance and promotion. On the other hand, there are fewer psychiatrists than in the world's middle- and high-income countries.¹⁶ According to a recent largescale survey, the prevalence of mental illness among adolescents aged 6 to 16 is 17.5%,¹⁷ and the elderly population is also facing a serious mental health crisis, with 1/5 of patients over 65 years of age meeting the diagnosis of depressive disorder.¹⁸ However, another meta-analysis discovered that the identification rate of depression and anxiety disorders in China is less than 30%. Additionally, only less than 40% of the population seeks professional psychological help for mental health issues, while over 60% consider pharmaceutical treatment harmful.¹⁹ Previous study has shown that active help-seeking is beneficial to mental health literacy levels.²⁰

Existing literature suggests that improving mental health outcomes is contingent upon increasing the level of mental health literacy.^{21,22} Despite this, studies on mental health literacy in China are still in their infancy, predominantly focusing on knowledge levels and attitudes towards mental health among various populations. There is a lack of comprehensive research examining multiple aspects of mental health literacy and conducting surveys with large sample sizes. On the other hand, previous research on mental health literacy has predominantly concentrated on college students and adolescents, with fewer investigations conducted among the general population residing in urban and rural residents.^{23–25}

Besides, Guangdong Province, situated in the southern region of China, stands out as the country's most economically advanced and densely populated province. The 2020 census revealed that Guangdong was home to a staggering 126 million individuals, with a remarkable 74.15% residing in urban areas. However, this prosperity comes with a caveat; the urban-rural income ratio stands at 2.46:1, indicating a considerable disparity between the two sectors. Consequently, this uneven development between urban and rural areas emerges as the foremost challenge to achieving high-quality growth in Guangdong. Influenced by the dual structure of urban and rural areas, China's social, economic and cultural development has been marked by the phenomenon of "strong urban and weak rural areas. However, there are fewer studies on the development of mental health literacy in urban and rural areas in this region.

Thus, this study aims to explore the different components of mental health literacy (such as mental health knowledge, Positive mental attitude, mental health information acquisition, mental health awareness, recognition of psychological illness, attitudes towards seeking professional help, and coping with psychological distress) among Guangdong urban and rural residents and identify their influencing factors. We anticipate that the findings from this study will provide valuable insights into the determinants of mental health literacy, assisting policymakers in making informed decisions when formulating mental health policies and plans, ultimately benefiting the mental health of the Chinese population.

Methods

Subjects

Permanent residents of Guangdong Province, China, aged 18 or above (born before September 1, 2004 and have resided in Guangdong Province, China, for at least 6 months).

Sampling Principles

In order to ensure the representativeness of the survey sample within the regional population, a random sampling technique with equal volume of multistage stratification was employed. This approach took into account the varying economic levels across different regions, the need for consistent geographical distribution coverage, as well as the practical feasibility of conducting the survey. This sampling method is widely employed as it effectively obtains a representative group of samples by segmenting the entire population into distinct layers and subsequently conducting random sampling within each layer. By doing so, it significantly mitigates sampling errors and enhances the overall representativeness of the sample. Furthermore, this methodology has been extensively utilized in numerous other studies. This sampling method is also convenient for organization and implementation of the survey in all the 21 prefecture-level cities in Guangdong Province. The survey method is based on a targeted and centralized survey, supplemented by

a household survey. The survey period is from October to December in 2022. The study complied with the Declaration of Helsinki and was ethically reviewed.

Sample Size Estimation and Allocation

Based on the complex sampling design, the sample size estimation formula was used as follows: $n = \text{deff} \frac{z_{\alpha}^2 \times p(1-p)}{d^2}$, where the design efficiency *deff* was set at 2.0, with a confidence level α of 95% (two-sided). Considering the estimates of mental health literacy levels of adult residents of Guangdong Province reported by the results of the 2021 Guangdong adult residents' mental health literacy survey, *P* was found to be 12.1%. The allowable error, *d*, was taken as 0.2*p*. Using the above parameter values, the minimum sample size was calculated to be 1395 people. In consideration of an expected response rate of approximately 75.0% and a planned sample size of approximately 1860, the sample size was rounded up to 2000 people. Additionally, the sample was stratified by prefecture-level municipality, allowing it to represent the situation at each prefecture level. The minimum sample size for this stratification was 42,000 people, covering 21 prefecture-level municipalities across the province.

Sampling Method

Stage 1. Extraction districts (prefectures/municipalities): 21 prefecture-level municipalities across the province were included, and 3 districts or counties were randomly selected from each prefecture-level municipality. Each selected district or county was divided into urban and rural areas as defined by the National Bureau of Statistics of China.

Stage 2. Sampled streets/townships: 3 streets/townships were randomly sampled from each sample area (county/city).

Stage 3. Sampling the neighborhood (village) Commission: an additional 2 house (Village) boards were sampled from each sampled street/township.

Stage 4. Surveyed households were sampled with respondents: for each sampling neighborhood (village) board, 111–112 households were sampled using a systematic sampling method (eg, starting point and spacing determined by gate number). Additionally, for each household, 1 person was randomly sampled.

[Supplement Figure 1](#) is provided in the text to illustrate the specific sampling process thus ensuring a representative sample. Additionally, in China, the division between urban and rural areas is primarily based on the National Bureau of Statistics of China.

Survey Instruments

Based on the biopsychosocial model and with reference to previous evidence in the literature, the variables selected in this study were factors such as socio-economic demographic characteristics, habits of living behaviors (lifestyle), and somatic health (chronic diseases). Considering these factors are related to mental health literacy, the researchers included gender, residence, year of birth, height, weight, marital status, education level, chronic diseases, current occupation, per capita monthly household income, smoking habits, drinking habits, dietary patterns, frequency of physical exercise, and time spent using electronic devices.

The National Mental Health Literacy Questionnaire (NMHLQ) is the designated questionnaire for monitoring the indicators of the National Health Commission of the People's Republic of China's "Mental Health Promotion Action". It consists of three parts: judgment questions, self-assessment questions, and case questions.

1. The judgment question mainly aims to gauge one's level of mental health knowledge. It is scored out of a total of 20 points, with 0 points awarded for unanswered questions or choosing not to respond. Each correctly answered question earns 5 points. The overall score ranges from 0 to 100 points, with meeting a score greater than 80 indicating proficiency.
2. The self-assessment questions primarily focused on evaluating attitudes towards mental health and encompassed three dimensions: positive mindset, acquiring mental health information, and being aware of one's mental health. Positive thinking pertains to maintaining self-esteem, self-confidence, rationality, calmness, and a positive outlook in the face of adversity. Mental health information acquisition pertains to the ability to obtain relevant information about mental health. Mental health awareness refers to the extent to which individuals prioritize and value their mental well-being. The assessment consists of a total of eight questions, each carrying a score ranging from 1 to 4 points. A minimum score of 24 points is considered the desired target.

3. Case questions primarily assess mental health skills, including the identification of psychological disorders with correct rates of identifying depression and social anxiety disorders. Psychological professional help-seeking attitudes are also evaluated, as well as the ability to overcome illness stigma. The identification of mental illness refers to the prompt detection and recognition of mental health issues in oneself or others. Psychological professional help-seeking attitudes reflect the tendency to seek assistance from mental health professionals when experiencing psychological problems. Overcoming distress involves conquering feelings of self-ill pubarche and public ill pubarche. Self-illness stigmatization refers to the internalized negative experiences associated with mental illness, which often result in attitudes and behaviors such as social avoidance and concealing one's condition. Public disease stigma refers to societal attitudes and biases towards mental illness, including rejection, discrimination, and contempt. Each case consists of four questions, and there are a total of two cases. The maximum score is 40 points, with a passing threshold set at a minimum of 28 points.
4. Measurement standards for individual mental health literacy: the total score of judgment questions is greater than or equal to 80 points; the total score of self-assessment questions is greater than or equal to 24 points, and the total score of case questions is greater than or equal to 28 points. Level of mental health literacy (%) = (number of people who achieved the mental health literacy standard / number of people surveyed) × 100%.

The Cronbach coefficient for this scale was 0.870 and the Kaiser-Meyer-Olkin coefficient was 0.891.

Statistical Analysis

The IBM SPSS Statistics 26.0 (IBM Corp, Armonk, New York) basic package was utilized for database curation and statistical analysis. For descriptive statistical estimation of constituent ratios and prevalence among populations with different characteristics, the complex samples package was employed. The distribution of various sociodemographic characteristics in the study population and the comparison of rates were analyzed using the Rao Scott correction for sampling design χ^2 test. To compare the scores of NMHLQ subscales between urban and rural residents, an independent sample *t*-test was conducted. Additionally, binary multivariate logistic regression was employed to investigate the factors associated with mental health literacy. Statistical significance was determined using two-sided testing with $\alpha=0.05$.

Results

Demographic Data of Rural and Urban Adults

The planned sample size for this investigation was 53605, and one permutation was used for those lost to follow-up in the initial sample, with an average permutation rate of 14.89%, and the actual completed effective sample was 51774, with an effect response rate of 84.37%. 31802 (61.4%) were urban and 19972 (38.6%) were rural. [Table 1](#) preliminarily shows the urban-rural residents' differences in demographic and health-related factors.

There was no apparent disparity in the sex ratio between urban and rural residents. However, it was observed that adult residents in urban residents tended to be younger, more educated, and more likely to be unmarried when compared to their rural residents. Additionally, the per capita income of households in rural residents was significantly lower than that of urban residents. Moreover, rural residents exhibited a lower prevalence of chronic diseases in comparison to urban residents. Furthermore, the study also disclosed that urban residents had a higher proportion of mental worker and spent more time using mobile phones. They also had a lower percentage of individuals who currently smoke or consume alcohol, and they generally followed healthier dietary and exercise habits. Conversely, urban residents had a higher occurrence of obesity and underweight individuals ([Table 1](#)).

Comparison of Mental Health Knowledge Among Urban and Rural Residents

Nearly half of the subjects in the mental health knowledge entry responded correctly less than 50% for urban and rural residents. The knowledge rate of rural residents is higher than that of urban residents for item 16, "Hypertension, coronary heart disease and gastric ulcer are all psychosomatic diseases". For the remaining 19 items, the knowledge rate of urban residents was higher than that of rural residents ([Table 2](#)).

Table I Demographics, Lifestyles and Chronic Disease of Rural and Urban Adults in Guangdong Province of China^a

Items	Total (N)	Urban (N, %)	Rural (N, %)	F	P
Age (years)				303.75	<0.001
18~44	28,789	1927 (61.8)	9515 (47)		
45~64	17,418	9903 (29.6)	7515 (35.4)		
≥65	5567	2625 (8.6)	2942 (17.6)		
Gender				1.04	0.31
Male	24181	14,117 (53.1)	10,064 (52.4)		
Female	27593	17,685 (46.9)	9908 (47.6)		
Educational level (years)				1457.06	<0.001
≤6	7767	2681 (7.6)	5086 (26.4)		
6~12	25,597	14,574 (42.8)	11,023 (54.8)		
≥12	18,410	14,547 (49.6)	3863 (18.8)		
Marital status				115.40	0.04
Unmarried	7782	5569 (24.4)	2213 (15.7)		
Married	41781	24,823 (71.8)	16,958 (80.6)		
Widowed or divorced	2211	1410 (3.8)	801 (3.7)		
Occupation				760.71	<0.001
Mental worker	12354	9163 (31.3)	3191 (17.2)		
Manual worker	25846	12,444 (37.5)	13,402 (66.6)		
Unemployed	9909	7068 (21.2)	2841 (13.7)		
Retired	3665	3127 (10)	538 (2.5)		
Monthly household income¥ (yuan)				1506.17	<0.001
≤3500	20,509	8998 (27)	11,511 (58.3)		
3500~9000	25,116	17,486 (56.1)	7630 (38.2)		
≥9000	6149	5318 (16.8)	831 (3.5)		
Smoking status				57.17	<0.001
No smoking	39150	24,987 (78.6)	14,163 (70.9)		
Now smoking	11012	5809 (18.3)	5203 (26.1)		
Used to smoke, now quit	1612	1006 (3.1)	606 (3.0)		
Consume alcohol				8.01	<0.001
No	42088	26,063 (80.4)	16,025 (81.2)		
Current regular drinker	7667	4463 (14.9)	3204 (15.2)		
Had been a regular drinker and currently abstained from alcohol	2019	1276 (4.6)	743 (3.6)		
Diet regularly				95.03	<0.001
Yes	50012	30,499 (94.7)	19,513 (97.5)		
No	1762	1303 (5.3)	459 (2.5)		
Regular exercise				10.33	0.01
Yes	14187	(74.8)	(76.5)		
No	37587	(25.2)	(23.5)		
Time spent using electronic equipment				407.74	<0.001
≤2 hours	28152	15,154 (45.5)	12,998 (64.9)		
2~6 hours	18832	12,946 (42.1)	5886 (29.3)		
≥6 hours	4790	3702 (12.4)	1088 (5.8)		
Chronic diseases				33.69	0.001
Yes	15065	9587 (29.5)	5578 (26)		
No	36709	22,215 (70.5)	14,494 (74)		
BMI				8.67	<0.001
≤18.5	3792	2410 (8.5)	1382 (7.3)		
18.5~23.9	30,013	18,351 (56.5)	11,662 (58.9)		
≥24	17,969	11,041 (35)	6928 (33.8)		

Notes: Bold P values: $P < 0.05$; a: All analyses were complex weighted.

Table 2 Comparison of Urban and Rural Residents' Mental Health Knowledge Awareness Rate^a

Items	Total (%)	Urban (%)	Rural (%)	F	P
Causes and prevention of mental illness					
1. Proper exercise can reduce anxiety, depression and other mental psychological problems. (Right)	93.7	94.5	91.4	72.23	<0.001
2. The main cause of most psychosomatic abnormal problems is genetic. (Right)	45.5	48.6	35.7	398.41	<0.001
5. Increased social activity in older adults can help slow the decline of brain function. (Right)	93.9	94.5	91.7	65.42	<0.001
10. Watching photos or videos of car accidents and disaster scenes may cause psychological trauma. (Right)	74.3	75.0	72.2	22.62	<0.001
11. Sustained stress has little impact on psychosocial well-being than a sudden traumatic blow. (Wrong)	46.9	50.2	36.8	412.39	<0.001
Symptoms and recognition of mental illness					
14. Having a cleanliness problem is OCD. (Wrong)	42.5	44.6	35.7	184.35	<0.001
17. Using the online psychological questionnaire, you can diagnose whether you have a mental illness. (Wrong)	41.8	43.6	36.3	124.56	<0.001
18. Whether a person has mental illness or not is easy to see. (Wrong)	46.9	50	37.2	368.36	<0.001
19. If the medical examination is normal, but you always suspect that you have a disease, it may be a mental illness. (Right)	78.4	78.7	77.5	4.72	0.03
Treatment of mental illness					
7. Proactively confronting things or situations that trigger anxiety can help gradually reduce anxiety problems. (Right)	81.9	82.3	80.7	9.05	<0.001
8. The sooner psychiatric disorders are treated, the better. (Right)	94.8	95.3	93.1	44.86	<0.001
9. Psychosomatic disorders can be alleviated and even recovered when treated effectively. (Right)	88.3	89.4	85.1	78.10	<0.001
20. When a psychiatric disorder gets better with medication, you can reduce the amount of medication while observing it yourself. (Wrong)	39.3	40.4	35.9	47.43	<0.001
Mind-body health associations					
15. Bad emotions may trigger physical diseases.	90.2	91.0	87.6	65.91	<0.001
16. Hypertension, coronary heart disease, and stomach ulcers are all psychosomatic diseases. (Right)	59.1	57.7	63.6	82.21	<0.001
Child protection and education					
3. Excessive stress and lack of exercise in children are detrimental to brain development. (Right)	88.9	89.6	87	34.59	<0.001
4. To develop your child's self-confidence, you should always praise your child for being smart. (Wrong)	11.2	11.5	10.4	8.79	0.003
Other basic knowledge and principles					
6. Emotions such as anxiety and restlessness are harmful. (Wrong)	16.1	17.3	12.5	99.35	<0.001
12. People who suffer from insomnia at night should catch up on their sleep during the day. (Wrong)	45.8	47.4	41	91.99	<0.001
13. Drinking a small amount of alcohol before bedtime can help improve the quality of sleep. (Wrong)	36.0	36.4	34.8	5.87	0.02

Notes: Bold P values: $P < 0.05$; a: All analyses were complex weighted.

Comparison of Achievement Rates of Mental Health Literacy Between Urban and Rural Residents

The rate of attainment of mental health knowledge is calculated by specific subgroups (urban and rural residents). The rate of achievement of mental health literacy was 13.6% among urban residents, which was significantly higher compared to the rate of 8.6% among rural residents. The attainment of mental health skills was also higher among urban residents (17.3%) than rural residents (11.6%), while the rate of attainment of mental health knowledge levels was lower among urban residents than among rural residents (88.9% vs 91.5%). These differences were also seen in the respective subscales. Urban residents performed better in areas such as mental health awareness, identification of psychological diseases, and overcoming illness stigma. Conversely, rural residents showed higher scores in positive mentality, mental health information acquisition, and seeking psychological professional help. Similarly, urban residents displayed higher rates of correct identification of depression and social anxiety disorders compared to their rural residents (Table 3, Figures 1 and 2). Such results also exist between rural and urban residents at different ages and by gender, as described in the supplementary material (Supplement Tables 1 and 2).

Regression Analysis of Factors Related to Mental Health Literacy Among Urban and Rural Residents

The findings revealed that certain factors were associated with the attainment of mental health literacy in urban residents. Specifically, being female, having an education level of 12 years or higher, being Mental worker, being

Table 3 Mental Health Literacy Measures According with Residence Area^b

Items	Urban (31802)	Rural (19972)	Statistics	
	Mean ±SD	Mean ±SD	t	P
Knowledge of mental health	61.21±15.99	58.19±18.07	19.81	<0.001
Positive mental attitude	10.01±2.02	10.32±1.99	-17.25	<0.001
Access to mental health information	6.76±1.17	6.86±1.19	-9.48	<0.001
Mental health consciousness	11.22±1.30	11.13±1.38	7.49	<0.001
Mental illness recognition	9.98±4.42	9.78±4.59	4.82	<0.001
Psychological professional help seeking attitudes	6.47±1.92	6.54±1.93	-3.80	<0.001
Overcoming the stigma of illness	13.02±3.34	12.25±3.76	23.80	<0.001
	N (%) ^c	N (%)	F ^d	P
Mental health literacy attainment rate	3741 (13.6)	2049 (8.6)	166.47	<0.001
Mental health knowledge attainment rate	4755 (17.3)	2655 (11.6)	163.12	<0.001
Mental health attitude attainment rate	28712 (88.9)	18,286 (91.5)	40.56	<0.001
Mental health skills attainment rate	19844 (63.1)	11,252 (56.6)	99.83	<0.001
Correct recognition rate of depressive disorders	11739 (29.3)	5785 (23.2)	166.47	<0.001
Correct recognition rate of social anxiety disorder	20432 (53.1)	11,057 (43.8)	299.51	<0.001

Notes: Bold P values: P < 0.05; b: The independent sample t-test was conducted; c and d: All analyses were complex weighted.

a retiree, having a higher monthly household income, maintaining a regular diet, and using electronic products for 2–6 hours per day were all protective factors for mental health literacy attainment. On the other hand, having chronic diseases, being a smoker, having a history of drinking, and being manual worker were identified as risk factors. In contrast, among rural dwellers, being married, being younger, having an education level of 12 years or

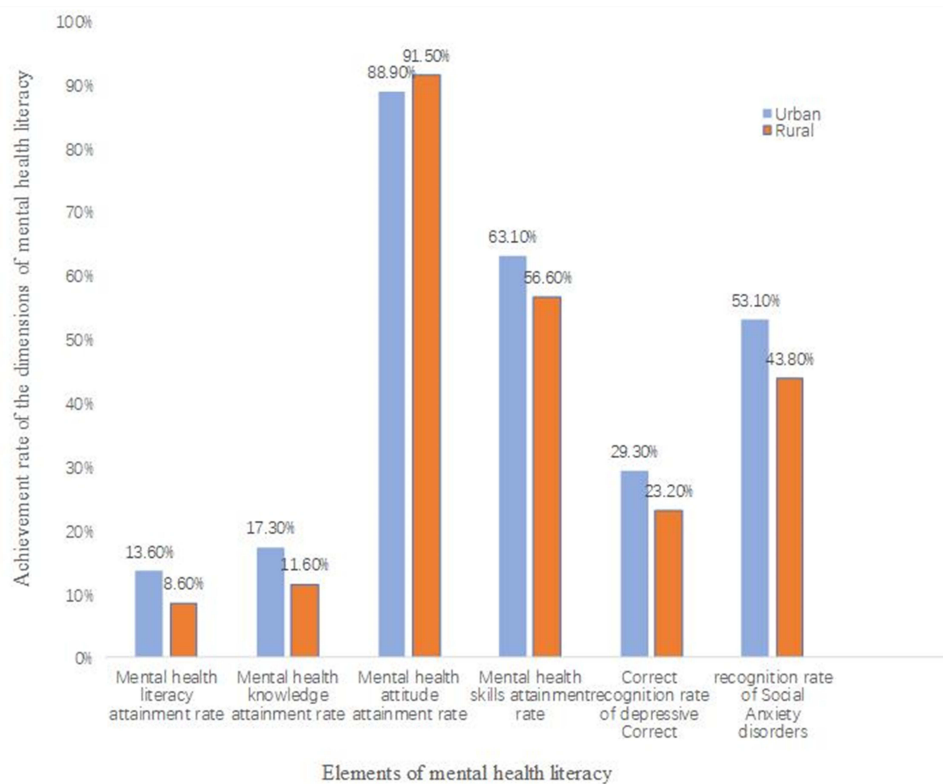


Figure 1 Comparison of mental health literacy attainment rates of urban and rural residents.

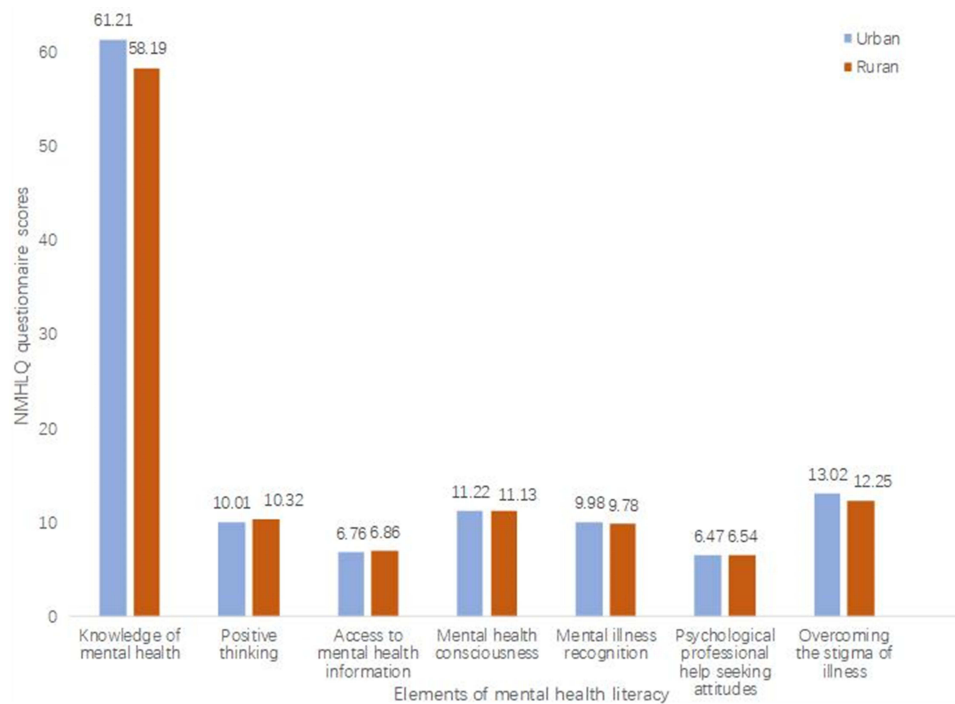


Figure 2 Comparison of mental health literacy subscale scores between urban and rural residents.

higher, being mental worker and manual worker, using electronic products for 2–6 hours per day, maintaining a regular diet, and engaging in regular exercise were protective factors for achieving mental health literacy. Additionally, previous smoking was identified as a risk factor (Table 4).

Table 4 Binary Multivariate Logistic Regression Analysis of Factors Related to Mental Health Literacy Among Urban and Rural Residents^e

Urban	B	S.E.	Wald	P	OR	95% CI for OR
Gender: Refer to male						
Female	0.16	0.04	13.42	<0.001	1.18	1.08 to 1.28
Marital status:Refer to Unmarried						
Married	-0.03	0.05	0.46	0.50	0.97	0.88 to 1.06
Widowed or divorced	-0.01	0.10	0.02	0.90	0.99	0.81 to 1.201
Age: Refer to 65 years						
18~44 years	-0.03	0.05	0.36	0.55	0.97	0.89 to 1.067
44~65 years	0.11	0.09	1.39	0.24	1.12	0.93 to 1.336
Education: Refer to≤6 years						
6~12 years	-0.09	0.08	1.14	0.29	0.92	0.78 to 1.075
≥12 years	0.48	0.09	32.04	<0.001	1.62	1.37 to 1.914
Occupation:Refer to unemployed						
Manual worker	-0.12	0.05	5.90	0.02	0.89	0.80 to 0.98
Mental worker	0.21	0.05	17.304	<0.001	1.23	1.12 to 1.354
Retired	0.10	0.08	1.72	0.19	1.11	0.95 to 1.30
Monthly household income¥ (yuan): Refer to≤3500						
3500~9000	0.14	0.05	9.41	0.002	1.15	1.05 to 1.26
≥9000	0.30	0.06	28.82	<0.001	1.35	1.21 to 1.51

(Continued)

Table 4 (Continued).

Urban	B	S.E.	Wald	P	OR	95% CI for OR
Time spent using electronic equipment: Refer to ≤2 hours						
2–6 hours	0.09	0.04	5.30	0.02	1.09	1.01 to 1.18
≥6 hours	−0.05	0.06	0.75	0.39	0.95	0.85 to 1.07
Chronic diseases: Refer to NO						
YES	−0.20	0.04	22.09	<0.001	0.82	0.76 to 0.89
BMI: Refer to 18.5–23.9						
≤18.5	0.10	0.06	2.32	0.13	1.10	0.97 to 1.25
≥24	−0.03	0.04	0.38	0.54	0.98	0.90 to 1.055
Regular exercise: Refer to NO						
YES	−0.01	0.04	0.10	0.75	0.99	0.91 to 1.07
Diet regularly: Refer to NO						
YES	0.55	0.11	23.75	<0.001	1.74	1.39 to 2.17
Smoking status: Refer to No smoking						
Now smoking	−0.30	0.07	21.05	<0.001	0.74	0.66 to 0.84
Used to smoke, now quit	−0.48	0.14	12.47	<0.001	0.62	0.48 to 0.81
Consume alcohol: Refer to NO						
Current regular drinker	−0.06	0.06	0.86	0.35	0.94	0.83 to 1.07
Had been a regular drinker and currently abstained from alcohol	−0.26	0.12	5.13	0.02	0.77	0.62 to 0.97
Rural	B	S.E.	Wald	P	OR	95% CI for OR
Gender: Refer to Male						
Female	0.09	0.06	1.99	0.16	1.09	0.97 to 1.23
Marital status: Refer to Unmarried						
Married	0.23	0.02	8.19	0.004	1.26	1.08 to 1.48
Widowed or divorced	0.13	0.15	0.77	0.38	1.14	0.85 to 1.53
Age: Refer to 65 years						
18–44 years	0.16	0.06	6.87	0.009	1.18	1.04 to 1.33
44–65 years	0.33	0.09	12.74	<0.001	1.39	1.16 to 1.66
Education: Refer to ≤6 years						
6–12 years	0.05	0.07	0.58	0.45	1.05	0.92 to 1.20
12 years	0.64	0.09	50.68	<0.001	1.90	1.59 to 2.27
Occupation: Refer to unemployed						
Manual worker	0.25	0.08	10.85	0.001	1.29	1.11 to 1.49
Mental worker	0.46	0.09	28.188	<0.001	1.587	1.34 to 1.88
Retired	0.14	0.16	0.72	0.40	1.15	0.84 to 1.58
Monthly household income¥ (yuan): Refer to ≤3500						
3500–9000	0.02	0.05	0.12	0.73	1.02	0.92 to 1.13
≥9000	−0.006	0.12	0.003	0.96	0.99	0.79 to 1.25
Time spent using electronic equipment: Refer to ≤2 hours						
2–6 hours	0.41	0.05	60.60	<0.001	1.50	1.36 to 1.67
≥6 hours	0.16	0.11	2.12	0.15	1.17	0.95 to 1.44
Chronic diseases: Refer to NO						
YES	−0.11	0.06	3.49	0.06	0.90	0.81 to 1.01
BMI: Refer to 18.5–23.9						
≤18.5	0.09	0.09	1.14	0.29	1.10	0.92 to 1.32
≥24	−0.02	0.05	0.09	0.77	0.99	0.89 to 1.09
Regular exercise: Refer to NO						
YES	0.26	0.05	24.86	<0.001	1.30	1.17 to 1.44
Diet regularly: Refer to NO						
YES	0.44	0.19	5.23	0.02	1.55	1.064 to 2.25

(Continued)

Table 4 (Continued).

Urban	B	S.E.	Wald	P	OR	95% CI for OR
Smoking status: Refer to NO smoking						
Now smoking	-0.06	0.07	0.76	0.38	0.94	0.81 to 1.08
Used to smoke, now quit	-0.55	0.18	8.88	0.003	0.58	0.40 to 0.83
Drinking habits:Refer to NO						
Current regular drinker	-0.08	0.08	1.03	0.31	0.92	0.79 to 1.076
Had been a regular drinker and currently abstained from alcohol	-0.09	0.15	0.37	0.54	0.92	0.69 to 1.22

Notes: Bold P values: $P < 0.05$; e: The binary multivariate logistic regression was employed.

Regression Analysis of Factors Related to Mental Health Literacy in Different Age Groups and Gender

Similarly different age groups have different influences on mental health literacy attainment. The protective factors that contribute to achieving the mental health literacy among individuals aged 18–44 years residents are being female, having an education level of 12 years or higher, being mental worker, having a higher monthly household income, maintaining a regular diet, and using electronic products for 2–6 hours per day. Conversely, being divorce or widowhood, having chronic diseases, being a smoker, having a history of drinking, and being manual worker were identified as risk factors. For the 45–64 years residents, the factors protect mental health literacy attainment include being married, having an education level of 12 years or higher, being employment and using electronic products for 2–6 hours per day. Additionally, being a smoker and having chronic diseases should likely be considered risk factors. Finally, for individuals over the age of 65 years residents, the protective factors for maintaining mental health literacy attainment include being married, maintaining a regular diet and exercise and using electronic products for 2–6 hours per day. The risk factor identified for this age group is being drinking ([Supplement Table 3](#)).

For male, being married, being younger, having a higher level of education, being mental worker, maintaining a regular diet and exercise and using electronic products for 2–6 hours per day serve as protective factors in achieving the mental health literacy standard. Conversely, have a chronic disease and being a smoker constitute risk factors. On the other hand, for female, being mental worker, Monthly household income greater than 9000 RMB, having an education level of 12 years or higher, maintaining a regular diet and exercise are the protective factors for attaining the mental health literacy standard, while chronic disease remains a risk factor ([Supplement Table 4](#)).

Discussion

This report primarily presents the fundamental situation of mental health literacy among urban and rural residents of Guangdong Province in China, specifically in the year 2022. The results indicate that only 13.6% of the urban residents in Guangdong Province achieved the required mental health literacy level, while just 8.6% of rural residents attained the targeted level. Unfortunately, these figures fall significantly short of the 20% target set for the 2022 resident health literacy level, as proposed by the Action Advancement Committee of Health China. Thus, it is evident that the overall mental health literacy level among Guangdong residents remains distressingly low. The reason behind this is that the mental health knowledge amongst both urban and rural residents is lacking. This is similar to previous studies in other Chinese provinces.^{26,27} The target rate for urban and rural residents' mental health knowledge is only 17.3% and 11.6% respectively. According to [Table 2](#), it is evident that the correct rate for the knowledge of nine problems amongst urban residents is less than 50%. For instance, the correct rate for recognizing the importance of developing children's self-confidence is only about 10%, indicating that residents have limited knowledge about the mental health of children and adolescents. To address this issue, it is necessary to enhance the promotion of children's and adolescents' mental health knowledge at the social, school, and family levels. Moreover, the correct rate for identifying emotions that are not harmful or beneficial, such as anxiety, is also very low, less than 20% for both urban and rural residents. This suggests that people lack sufficient knowledge about the function of negative emotions. Additionally, residents show low rates of correct knowledge for seven other questions, which calls for the development of corresponding educational materials to

improve knowledge in these areas. By strengthening promotional and educational efforts, it is possible to enhance the mental health knowledge of residents.²⁸

Both urban and rural residents displayed a higher compliance rate in the self-assessment part, which pertains to attitudes towards mental health, compared to the knowledge judgment (mental health knowledge) and case part (mental health skills). This difference may be attributed to the fact that the self-assessment primarily assesses one's state of mind and awareness of mental health when confronted with challenges, which is not closely linked to knowledge. The discrepancy in dimensional outcomes indicated that the majority of urban and rural residents possessed a positive mindset and a heightened awareness of mental health. However, their understanding of mental health knowledge was not comprehensive enough, and this awareness did not translate into tangible actions. Consequently, the reciprocal relationship between mental health knowledge and skills was unable to foster positive reinforcement. The lack of mental health knowledge leads to a low level of psychological literacy, which has also been seen in some previous studies.²⁹ This suggests that merely having a positive mindset and awareness of mental health is insufficient. Therefore, all levels of government and health education must expand the range of mental health education, enhance the content of mental health education, and guide the general public towards acquiring comprehensive knowledge and skills in mental health. By doing so, the overall level of mental health literacy can be improved.

This study revealed significant disparities in mental health literacy between urban and rural populations. Urban residents demonstrated higher levels of mental health knowledge, as well as greater accuracy in identifying depression and social anxiety disorders. In terms of overcoming illness stigma and mental health awareness, urban residents excelled, obtaining higher recognition scores for mental illness. However, rural residents outperformed urban residents in positive mentality, mental health information acquisition, and seeking psychological professional help. These findings were consistent across different age groups and genders. Similar results can be seen in previous studies in China.^{26,27} Several factors may contribute to these outcomes. Firstly, mental health promotion efforts in rural residents are inadequate, resulting in less attention to mental health and limited access to knowledge resources for residents. Secondly, significant variations exist between urban and rural residents in terms of economic conditions and cultural environment. Urban residents enjoy better economic prospects and have access to a wide range of educational opportunities, including mental health education. These findings corroborate previous studies that suggest mental health literacy levels are higher among urban residents, signaling the need for increased mental health education targeting rural residents to enhance their psychological literacy. Additionally, greater emphasis should be placed on cultivating a positive mindset among urban residents to effectively navigate life challenges.

The results of logistic regression analysis revealed that several factors were protective mental health literacy levels in urban residents. These included being female, having a higher level of education, possessing a higher economic income, using electronic products for 2–6 hours per day, being mentally active or retired, maintaining a regular diet. However, being engaged in physical work having chronic diseases, a history of smoking, or previous alcohol consumption was identified as a risk factor. In contrast, the protective factors of mental health literacy in rural residents were being married, having a higher level of education, being mentally and physically active workers, using electronic products for 2–6 hours per day, regularly exercising, and maintaining a regular diet. The only identified risk factor among rural residents was previous smoking. Consistent with previous research, this study found that women had higher levels of mental health literacy compared to men.^{2,30,31} This may be due to the fact that women are more intuitive about emotional understanding, or that women tend to use psychological and emotional labels more than men.^{32,33} The positive correlation observed between educational attainment, monthly family income, and mental health literacy in urban residents aligns with findings from prior studies.^{34,35} It suggests that individuals with lower education and income levels may have limited access to mental health resources and pay less attention to mental health knowledge. In contrast, individuals with higher education and income levels tend to lead healthier lifestyles, experience lower disease burden, and have more available mental health resources. The higher levels of mental health literacy observed among mental force workers and retirees, compared to those without these professions, may be due to their lower education and income levels, which limit their access to various resources. Also, employment is an important mental health intervention.³⁶

Individuals without chronic diseases exhibited higher levels of mental health literacy than those with chronic diseases. Previous studies have also shown lower levels of mental health literacy in patients with chronic diseases.³⁷ This may be

attributed to the emphasis on physical health over mental health in medical treatment, resulting in limited proactive access to mental health-related resources. The findings suggesting that individuals who use electronic products for 2–6 hours have better mental health literacy compared to those who use electronic products for less than or equal to 2 hours may be because mental health literacy knowledge is primarily web-based. Furthermore, lifestyle habits such as smoking, drinking, following a regular diet, and engaging in regular exercise were associated with mental health literacy. This may be because adverse habits like smoking and drinking are linked to negative emotional events,^{37,38} ultimately impacting mental health. Individuals who follow a regular diet and engage in regular exercise tend to lead more active lifestyles and prioritize their mental well-being,³⁶ leading to higher levels of mental health literacy. In conclusion, promoting good lifestyle habits can positively impact mental health literacy and should be a focal point in future interventions.

The study also found that younger age and being married were protective factors for mental health literacy among rural residents. This is similar to previous studies.^{28,37} This could be attributed to younger individuals in rural areas having a higher level of education and the fact that China did not implement 9-year compulsory education until 1986. As a result, older individuals may have lower levels of education and less access to mental health education knowledge. Additionally, the higher levels of mental health literacy observed among married individuals align with findings from previous study,³⁹ which also highlighted higher marriage rates in rural areas compared to urban areas. These results illustrate the differing influence factors on mental health literacy between urban and rural populations. Therefore, future interventions should target these factors individually to achieve better outcomes. In conclusion, the study revealed a low level of mental health literacy among urban and rural residents of Guangdong Province, with a significant disparity between the two areas. These findings highlight the need for continuing efforts to increase the dissemination of mental health knowledge in rural communities and improve overall levels of mental health literacy. In view of this, the Chinese Government is also gradually emphasizing the mental health literacy level of the population, such as vigorously carrying out mental health publicity and education, mental health promotion activities for teachers and students in schools, and psychological network self-help activities.

The findings need to consider some limitations. Firstly, it is important to note that this study is a cross-sectional study and therefore cannot provide insights into trends or establish causality regarding changes in mental health literacy among residents. Secondly, the survey failed to adequately assess the effects of recent life events on respondents' psychology. Finally, there are many factors that influence mental health literacy and this study may not take all of them into account. Despite these limitations, the survey had several notable strengths. Firstly, the effective questionnaire used in this survey met the minimum requirements and strictly adhered to the principle of stratified sampling. Additionally, the sample selected was highly representative, thus enabling the findings to be generalizable to the overall mental health literacy of Guangdong Province residents. Secondly, the sample size of 51,774 participants was sufficiently large for conducting this investigation. Thirdly, this study investigated the impact of common demographic factors on mental health literacy, providing a more comprehensive understanding of how these factors influence knowledge in this domain. Lastly, the use of on-site investigation methods ensured the reliability of the data collected.

Conclusion

The findings indicate a concerning lack of mental health literacy among both urban and rural residents of Guangdong Province. Furthermore, there is a significant disparity between mental health literacy levels in urban and rural areas. To enhance the mental health literacy level among urban residents, we must direct more focus towards male, individuals with limited education, those earning a low income, the unemployed, chronic disease sufferers, those with irregular dietary habits, and those engaged in unhealthy practices such as smoking and drinking. Similarly, for rural residents, greater emphasis should be placed on unmarried individuals, the elderly, the unemployed, those with limited education, irregular exercise and dietary patterns, and those with smoking habits. Additionally, encouraging the judicious use of electronic products among these populations can contribute significantly to improving their overall mental health literacy.

Data Sharing Statement

The datasets generated and/or analysed during the current study are not publicly available because the data are not allowed to upload on internet, but are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

The study protocol was approved by the Research Ethics Committee of the Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences (Reference number: KY-Z-2022-063-02). All participants provided written informed consent prior to participating in the survey.

Consent for Publication

All participants and authors gave their consent for publication.

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Disclosure

The authors declare that they have no competing interests.

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